

**Department of Electrical Engineering**  
**Indian Institute of Technology, Kanpur**

December 16, 2014

**Reference No: IIT/EE/LB/2014-2015/P/04**

**Sub: Inviting sealed quotations for 128/256 channels:**

**Sealed quotations are invited for 144/256 Channel general purpose of bio signal amplifier for high resolution EEG & BCI Studies. The requirements for each unit are mentioned as below:**

**Amplifier:**

- 128/256 Channel active electrode recording and 16/16 channel Passive electrode recording using the same amplifier.
- Interface should be via USB connection.
- ADC 24- bit: sampling rate 38.4 KHZ. Per channel.
- Amplifier type: Real DC coupled.
- Sensitivity: less than <60nv (LSB), +/-250mv.
- Input Impedance >100mvhm.
- It should be able to measure EEG, ECG, EMG, EOG, and ECOG without any saturation.
- It should have 8 digital trigger channel and a hold Input for artefact suppression.
- Different electrode connector box should be provided to use 128/256 active electrode and 16/16 passive electrodes.
- It should be compatible to use active dry electrodes.
- It should have internal impedance testing unit to test the skin electrode impedance.
- It should be a CE certified medical device

**Electrodes, Caps & Accessories:**

- 128/256 active gel electrodes with electrode interface box should be supplied.
- 16/16 active dry gold plated electrodes with electrode interface box should be supplied.
- EEG cap that should be compatible to use both active gel electrode & active dry electrode.
- Three different sized adult caps should be supplied with sizes 50-54 cm, 54-58 cm & 58-62 cm.
- The cap should have at least 74 labelled standard position plus 86 additional intermediate positions.
- It should be possible to add additional positions other than the default positions by the end user itself
- Caps and electrode should be washable.
- Double sided adhesive washers should provided to use the same active gel based EEG electrode for EMG, ECG & EOG recordings.

## **Software:**

- Should provide GUI based software for bio signal acquisition along with the video and recording and should be able to save the data in the “hdf5” format.
- Should provide high speed online processing blokset for the amplifier to collect the bio-signal within simulink model for real time processing.
- Should provide the real time analysis software for EEG, ECG, respiration, galvanic skin response under simulink.
- Should provide offline analysis tool boxes for bio-signals in MATLAB platform.
- Should provide classify toolbox for data classification to categories patterns and signal features of bio signal in two different classes in MATLAB platform.
- Should provide high resolution toolbox for 3D-spline laplacian and mapping. It should allow to combine EEG analysis with anatomy of the brain (MRI/fMRI/CT data).
- High resolution toolbox should be able to generate head model from MR/CT segmented volumes in MATLAB and also should provide standalone version without MATLAB.

## **Additional Sensors (if available):**

- Include a skin temperature sensor:
  - Accuracy  $0.2^{\circ}c$ , operating range ( $20-45^{\circ}c$ ).
  - Output (0-200) mv dc-1Hz.
  - Output cable with touch proof connector.
- Include GSR sensor to measure electro-dermal activity:
  - GSR sensor with finger electrode to use it with medical safe data acquisition system with  $\pm 250mV$  0(DC) -20Hz, output cable with touch proof connector.
- Actogram/Actigraphy system (Optional - can be removed if you don't have)
- Photic stimulator ( Optional - can be removed if you don't have)

## **For BCI application:**

- Should provide P300 model.
- Should provide a model for motor imagery based game (ping pong).
- Should provide SSVEP model & hardware with the small robot (e-puck).

## **Last date for submission of quote is January 08, 2015.**

The Quotation in sealed envelope should be sent to the following address:

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